## Remarks

Claims 1-28 are pending in the above-identified application. Claims 2 and 14 are currently amended, claims 6-11, 15 and 18 were previously amended, claims 1, 3, 13, 16 and 17 are cancelled, claims 19 - 28 are new, and claims 4, 5, and 12 are original.

The Examiner rejected claims 2-12 under 35 U.S.C. 102(e) as being anticipated by Moran (U.S. Patent 6,757,149).

The following legal requirement is quoted from MPEP 2131 and establishes what is required to sustain a rejection under 35 U.S.C. §102. "A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." Verdegaal Bros. v. Union Oil Co. of California, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987).

Moran discloses a method of controlling a fuel injector valve solenoid includes generating a set-point signal which models a desired current profile flowing through the valve solenoid, providing a current controller which is adapted to regulate the current flowing through the valve solenoid, and regulating the current flowing through the valve solenoid such that the current flowing through the valve solenoid closely matches the set point signal. Regulating the current includes measuring the current flowing through the valve solenoid, comparing the current flowing through the valve solenoid to the current profile of the set-point signal, and adjusting the current flowing through the valve solenoid to more closely match the current profile of the set-point signal.

Regarding claims 2, 4, 6, 7, 11, 12, the Examiner alleged that "Moran discloses a valve control circuit (figures 3, 5, 7) comprises a process control apparatus (such as a controller 44, 54) generating a plurality of data signals (46, 56), each signal corresponding to an operating parameter of the valve (e.g. col. 3, lines 49-63), a valve control apparatus (e.g. valve controller 62) transmitting a voltage (such as a voltage waveform generated from 62) to the valve to the operation of the valve (20), the valve control apparatus receiving at least one operating data signal generated by the process control apparatus, the valve having a current flow created therein upon receiving voltage from the valve control apparatus, a current sensing apparatus (current sensing resistor 68) senses the flow of current in the valve (col. 4, lines 1-6), the current sensing apparatus creating a signal (feedback signal) responsive to the current flow in the valve, the signal created by the current sensing apparatus applied to the valve control apparatus (see figure 2), the valve control controls the valve response to the signal from the current sensor, wherein a first polarized current (current wave form in figure 3, col. 2, lines 30-33, lines 60-66) is established in the valve to initiate motion of the valve in a first direction, a second reduced current (34) is established in the valve to stabilize the position of the valve in a first predetermined position (col. 3, lines 12-15)."

Applicant has amended independent claims 2 and 14 to more clearly identify the present invention. In particular, the claims have been amended to include the following: a first impulse current delivered to set the valve in motion toward an open state during a first time phase; a first low current delivered to stabilize the valve in the open state during a second time phase, the second low current having a lower amplitude than an amplitude of the first impulse current; a substantially zero current delivered for an electrically idle interval during a third time phase; a

second impulse current, which is polarized oppositely to the first impulse current, delivered to set the valve into motion toward a closed state during a fourth time phase; and a second low current, which is polarized oppositely to the first low current, delivered to stabilize the valve in the closed state during a fifth time phase, the second low current having a lower amplitude than an amplitude of the first impulse current.

This is supported in the specification as originally filed in paragraph 0036.

Moran does not anticipate the claimed invention. For example, Moran does not teach five time phases including a substantially zero current delivered for an electrically idle interval during a third time phase.

Regarding claims 3, 5, the Examiner alleged that "Moran discloses a third oppositely polarized current is established in the valve to initiate motion of the valve in a second direction, a second reduced current (42) is established in the valve to stabilize the position of the valve in a second predetermined position (see figure 7)."

However, this is incorrect. Moran explains that figures 4, 6, 7 and 8 are the steps wherein waveforms are combined to arrive at the setpoint waveform depicted in figure 3.

More specifically, Moran teaches the following:

> "Referring to FIG. 5, the input pulse 40 is sent to a first edge triggered one-shot device 44. The first edge triggered one-shot device 44 is adapted to generate a peak pulse 46 in response to receiving the input pulse 40. The peak pulse 46 has an amplitude 48 equal to the peak amplitude 32 less the hold amplitude 36 and a time duration, T.sub.2, equal to the combined pre-charge time and peak time, as shown in FIG. 6.

The peak pulse 46, and the input pulse 40 are input into a first inverting summer operation amplifier 50. The first inverting summer operation amplifier 50 is adapted to combine and invert the two incoming signals 46, 40. The peak pulse 46 and the input pulse 40 are combined and inverted by the first inverting summer operation amplifier 50 to generate a peak-hold pulse 52, as shown in FIG. 7.

Additionally, the input pulse 40 is input into a second edge triggered one-shot device 54 adapted to generate a pre-charge pulse 56 in response to receiving the input pulse 40. The pre-charge pulse 56 has an amplitude 58 equal to the difference between the peak amplitude 32 and the pre-charge amplitude 28 and a time duration equal to the pre-charge time, T.sub.1, as shown in FIG. 8.

A second inverting summer operation amplifier 60 receives the pre-charge pulse 56 and the peak-hold pulse 52, combines and inverts the two incoming signals 56, 52, and generates the set-point signal 24."

Thus it is clear that in Moran the third oppositely polarized current is established in the valve not to initiate motion of the valve in a second direction. It is a step in forming the setpoint waveform depicted in figure 3.

Regarding claims 8-10, the Examiner alleged that "Moran discloses upon the detection of a predetermined current on the valve, reduces the current applied to the valve (col. 4, lines 1-26)." However, with the amendment of independent claim 2 these dependent claims are now allowable over Moran for the reasons set forth above.

The Examiner rejected claims 14, 15, and 18 under 35 U.S.C. 102(a) as being anticipated by Near (U.S. Patent 6,978,978).

Regarding claims 14, 15, 18 the Examiner alleged that "Near discloses a method of controlling the operation of an electrically controlled valve comprises (figure 2b, 3) comprises creating a plurality of first electrical signals that correspond to at least one of the operation and control instructions for the electrically controlled valve (such as current magnitude, change voltage, col. 4, 5, lines 56-7), transforming the first signals into plural second signals and transmitting the second signals to controlled valve (15) (e.g. col col. 7, lines 1-26, and figure 2B), sensing the current level (current sensor 20) and providing a third signal (feed back signal from sensor 20), and providing a current to the valve responsive to the third signal (col. 7, lines 6-26), wherein the controlled valve includes a coil (14)."

Near discloses an electric fluid dispenser for dispensing a fluid onto a substrate. A power switching circuit is connected to an unregulated power supply providing a varying voltage. A solenoid connected to the power switching circuit operates a dispensing valve to move between open and closed positions. A control circuit is responsive to the varying voltage from the power supply and provides a drive signal to the power switching circuit having a time variable component determined by the varying voltage. The power switching circuit, in response to the drive signal, provides an output signal to the solenoid that causes the dispensing valve to move between the open and closed positions substantially independent of the varying voltage from the unregulated power supply.

Independent claim 14 has been amended similar to independent claim 2. For the reasons given above amended independent claim 14 is not anticipated by Near since Near does not teach

or suggest a first impulse current delivered to set the valve in motion toward an open state during a first time phase; a first low current delivered to stabilize the valve in the open state during a second time phase, the second low current having a lower amplitude than an amplitude of the first impulse current; a substantially zero current delivered for an electrically idle interval during a third time phase; a second impulse current, which is polarized oppositely to the first impulse current, delivered to set the valve into motion toward a closed state during a fourth time phase; and a second low current, which is polarized oppositely to the first low current, delivered to stabilize the valve in the closed state during a fifth time phase, the second low current having a lower amplitude than an amplitude of the first impulse current.

Thus, neither Moran nor Near anticipate or disclose the features of the pending claims and therefore with the amendment of the claims the rejections under 35 U.S.C. 102(b) have been overcome.

The dependent claims include all the limitations of the respective independent claims upon which they depend and therefore are also allowable over the cited prior art. Therefore, the pending present claims are not anticipated nor obvious in view of the cited prior art, and the rejection of the claims under 35 U.S.C. 102(b) should be withdrawn.

With this amendment Applicant has added new claims 19 - 28. The Examiner is respectfully to indicated the allowability of new claims 19 - 28.

Applicants have discussed herein one or more differences between the cited prior art, and the claimed invention with reference to one or more parts of the cited prior art. This discussion, however, is in no way meant to acquiesce in any characterization that one or more parts of the cited prior art correspond to the claimed invention.

Reconsideration and withdrawal of the rejections is therefore respectfully requested. In view of the above remarks, allowance of all claims pending is respectfully requested.

Any prior art made of record and not relied upon is considered to be of general interest only. This application is believed to be in condition for allowance, and such action at an early date is earnestly solicited. If a telephone conference would be of assistance in advancing the prosecution of this application, the Examiner is invited to call applicant's attorney.

Respectfully submitted,

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